**Biology Term 2B Project Options**

(400 points are needed for 0.5 credit)

*THIS IS NOT A STAND ALONE CREDIT; THIS IS* ***IN ADDITION*** *TO COMPLETING ALL CLASS WORK AT AN A or B LEVEL*

*20 points is equivalent to about 1 hour of work*

**50 points –A mini-biography and poster** (max of 2)

Research a scientist important in the history of DNA, RNA or genetics. Answer who, what, when, where, why AND the following:

* Birth / death dates
* What motivated the person to dedicate his/her life to studying DNA, RNA or genetics?
* what his/her training was?
* who was influential in his/her life?
* how she/he came to do the work she/he did?
* what difficulties she/he encountered?
* what she/he accomplished?
* how she/he did it? what tools were used or developed?
* What was the impact of his/her work?
* what she/he are doing now (if they are still living)?
* Think of other things you would like to know about the person and try to find answers.

Write a short biography of this person (300 – 500 words) and present it orally along with a visual poster to your class in a way that will help the class understand how important one individual can be to science.

**10 points per generation– Personal Pedigree**

* Create a pedigree for your family or a famous family going back at least 2 generations.
  + Use accurate pedigree symbols
  + Indicate the trait being traced and whether the trait is dominant, incomplete dominant, co-dominant or receive
  + State the alleles for the trait for each individual

**40 points – Personal Genome project (nova now)**

* + Complete the Personal Genome project handout; including
    - Viewing the clips
    - Filling in the patient record
    - Completing the punnett squares
    - Determining the probability of disease
    - Generating the pedigree
    - Answering the questions

**60 points – video analysis** (max of 2)

* + Select and view a movie in which DNA or genetics have a starring role (are integral to the story) (may be fiction or non-fiction) (ex: gattaca, jurasic park, the sixth day, splice, x-men, bourne legacy, others upon teacher approval)
  + Create a learning document about the film. Include:
    - Title of movie
    - Director
    - Genre
    - Setting
    - Descriptions of the major characters
    - Concise plot summary
    - Map of the sequence of events
    - Timestamp of specific scenes in which DNA, RNA or genetics are integral
    - Description of the scene and the information shared
    - Explanation of how you know it is relevant to this class
    - Statement about whether or not you think the portrayal of genetic engineering is accurate, possible or probable
    - Star rating (1 – hated it, 2 – didn’t really like it, 3 – liked it, 4 – really liked it, 5 – loved it)

**15 points per review - Conduct a series of reviews** on genetics or DNA websites (max of 5)

* Include
  + The name of the site and it’s url
  + Title of the page
  + Author
  + Year of publication or last update
  + Summary of the site
  + List of the specific DNA, RNA or genetics concepts described / experienced
  + Summary of things you liked about the site
  + Summary of things you did not like about the site
  + Star rating (1 – hated it, 2 – didn’t really like it, 3 – liked it, 4 – really liked it, 5 – loved it)

**40 points – Create a children’s book or puppet show** around the concepts/ideas of DNA, RNA or genetics (max 1)

* Original, creative work and idea
* Must have a characters, a sequence of events that make sense, an introduction, conflict, climax and resolution
* Must include explicit examples or references to inheritance or codes.
* Proper Grammar, usage, mechanics and spelling required

**100+ points – Create a portfolio of information on Genetic Engineering** (max 2)

* Select a topic and create an online binder or a physical 3-ring binder of information on the topic to share with others. Include:
  + Research genetic engineering in AT LEAST 4 different sources. Create a page in your binder for each source:
    - state the source (URL, book, magazine, video, etc)
    - using complete sentences, explain what you learned from it (in your own words)
    - using complete sentences, explain how it helped you to better understand genetic engineering
    - List the questions you had after evaluating the source
  + Place the source pages for your research in your binder in order from MOST helpful to Least helpful. (10 points per source)
  + Write a paragraph explaining how the sources were the same, how they were different and which single source helped you the most in understanding what genetic engineering is (25 points)
  + Description of genetic engineering in general (10 points)
  + *Specific explanation* (be sure to use both the scientific explanation and also describe the process in your own words) of how it works for your chosen topic in in either – medicine, agriculture, technology or other applications (20 points)
  + A series of images of the what has been created by this genetic engineering through time (past to present) (2 points per image)
  + A 300 – 500 word essay explaining YOUR OPINION on whether or not this specific type of genetic engineering is beneficial or harmful to the future of life on Earth. (20 points)

**100+ points – Create a portfolio of information on Selective Breeding** (max 2)

* Select a topic and create an online binder or a physical 3-ring binder of information on the topic to share with others. Include:
  + Research on selective breeding processes and practices in AT LEAST 4 different sources. Create a page in your binder for each source:
    - state the source (URL, book, magazine, video, etc)
    - using complete sentences, explain what you learned from it (in your own words)
    - using complete sentences, explain how it helped you to better understand selective breeding
    - List the questions you had after evaluating the source
  + Place the source pages for your research in your binder in order from MOST helpful to Least helpful. (10 points per source)
  + Write a paragraph explaining how the sources were the same, how they were different and which single source helped you the most in understanding what selective breeding is (25 points)
  + Description of selective breeding in general (10 points)
  + *Specific explanation* (be sure to use both the scientific explanation and also describe the process in your own words) of how it works for your chosen organism (20 points)
  + A series of images of how selective breeding has changed your organism through time (past to present) (2 points per image)
  + A 300 – 500 word essay explaining YOUR OPINION on whether or not this specific type of selective breeding is beneficial or harmful to your organism. (20 points)

**Up to 400 points – Book Review**

* Read a book that includes an exploration in DNA, RNA, Mutations, selective breeding or genetic engineering. For example:
  + The House of the Scorpion – by Nancy Farmer
  + The Hunger Games – By Suzanne Collins
  + The Seven – by Sean Little
  + Under the Never Sky – by Veronica Rossi
  + Unwind – by Neil Shusterman
  + Legend – by Marie Lu
  + Birthmarked – by Caragh O’Brien
  + the Moreau series of books by [S. Andrew Swann](http://en.wikipedia.org/wiki/S._Andrew_Swann)
  + Jurassic Park – by Michael Crichton
  + others upon teacher approval
* Documentation of the time spent reading the book (date, time, page# - page#)
* Write a chapter summary for each chapter (just a paragraph)
* Create a learning document about the book. Include
  + Title (underlined)/Author
  + Publication Information: Publisher, year, number of pages
  + Genre
  + Setting
  + Descriptions of the major characters
  + Concise plot summary
  + Map of the sequence of events
  + Specific examples from the book (page number and passage) about genetic engineering, selective breeding, mutations, DNA or RNA
  + Answers to the following questions:
    - Is the writing effective, powerful, difficult, beautiful?
    - What are the strengths and weaknesses of the book?
    - What are the author's qualifications to write about the subject?
    - Do you agree with the author's point of view?
    - What is your overall response to the book? Did you find it interesting, moving, dull?
    - Would you recommend it to others? Why or why not?
  + Conclusion - a paragraph summary that pulls all your thoughts on the book together including what impressions the book left you with and what you want other readers to know about the book.